BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Subsidiary Diploma in Applied Science Pearson BTEC International Level 3 Foundation Diploma in Applied Science Pearson BTEC International Level 3 Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Applied Science Pearson BTEC International Level 3 Extended Diploma in Biomedical Science
Unit number and title	**Unit 23: Materials Science**
Learning aim	**D**: Examine materials used in applications in order to reduce carbon emissions for a sustainable future.
Assignment title	**Managing our 'Carbon Footprint'**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are a volunteer for Friends of the Earth. You have been asked to use your scientific training to produce a portfolio of case studies that will demonstrate how materials are used in applications to reduce carbon emissions. This portfolio will be used to encourage other organisations to employ technology to further reduce their carbon emissions.

Task	Using your lesson notes and research you have carried out into applications that reduce carbon emissions, produce a portfolio of case studies for Friends of the Earth. Choose any **THREE** case studies from the following list to include in your portfolio: • Polymers for electrolyte membranes and ceramic based electrodes in fuel cells • Glass fibre composites and aluminium in wind turbine blades • Silicon wafer and cadmium telluride in solar photovoltaic cells • Allium arsenide (GaA) and gallium nitride in light-emitting diodes (LEDs) For each case study chosen provide information about the functionality and suitability of the materials to **explain** how they can be used to reduce global carbon emissions. **Compare** the three different methods (wind turbines, fuel cells and solar photovoltaic cells) used to reduce carbon emissions. Identify the main factors involved and explain why the different

	methods are used for the materials given in the case studies. **Evaluate** the benefits and limitations of using each of the materials for the applications in the case studies to reduce global carbon emissions. You will need to provide appropriate evidence on which to base your conclusions.
Checklist of evidence required	A portfolio of three case studies which: • Provides information about the functionality and suitability of the materials to **explain** how they can be used to reduce global emissions; • **Compares** the three different methods (wind turbines, fuel cells and solar photovoltaic cells) used to reduce carbon emissions; • **Evaluates** the benefits and limitations of using each of the materials for the applications in the case studies. Sources of information must be appropriately referenced. Correct scientific terminology must be used.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
D. D4	Evaluate the benefits and limitations of using materials in order to reduce carbon emissions.
D. M4	Compare methods used to reduce carbon emissions for materials used in given applications.
D. P6	Explain how materials can be used to reduce global emissions.

Sources of information to support you with this Assignment	http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.464.5842&rep=rep1&type=pdf http://www.azooptics.com/Article.aspx?ArticleID=147 http://americanhistory.si.edu/fuelcells/basics.htm http://spectrum.ieee.org/energywise/green-tech/fuel-cells/ge-claims-fuel-cell-breakthrough-starts-pilot-production http://eartheasy.com/live_energyeff_lighting.htm#led